



XS 2000 HT Installation Manual



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Warning

Carefully read this manual and the Instruction Manual **before** installing and connecting the projector.

The projector is powered by high current.
Only qualified persons should open the covers and perform the settings, in accordance with the safety rules and regulations.

Picture quality depends greatly on how well the projector is installed, configured and setting. You are thus advised to have the projector installed by trained technicians.

You are advised to follow the procedures gives in flowchart "A" when installing and setting the video projector.

If, when you placed your order, you specified the installation parameters, then just follow flowchart "B".

When you place your order you may ask for the projector to be prepared and set-up to the installation requirements. Thus, when the projector is being installed only a few adjustment will be required in order to obtain the best results. This will assure the best picture quality and save the installation technician a waste of time and work.

When ordering specify:

Kind or installation: ceiling front projection..... floor front projection
 ceiling rear projection..... floor rear
projection

Picture size: L X H

Approximate projection angle :

List "A": configuring, installing and setting the projector.

Kind of installation
(page 7)



Picture size and projector-screen distance
(page 8)



Focus correction spacers
(page 10 /11)



Deflection inversion
(page 12 /13)



Resetting the convergence settings
(page 21)



Fixing the brackets and the screen
(page 8)



Installing the projector



Power cable and input connections
(see instruction manual)



- Switching on and setting
- Mechanically centring the optical axes (page 16)
 - Magnetically centring the raster
 - Rotating the yokes
 - Optically focusing the lenses (page 14)
 - Electronic and magnetic focusing (page 15)
 - Fine adjusting the convergence
 - Bank.. configuration ..



Closing the covers..

List "B": installation and setting the projector if installation parameters were supplied when ordering.

The following have already been decided:
installation choice, screen size,
projector-screen distance, optical focusing asymmetric correction spacers,
deflection inversion, yoke rotation.



Fixing the brackets and the screen
(page 8)



Installing the projector



Power cable and input connections
(see instruction manual)



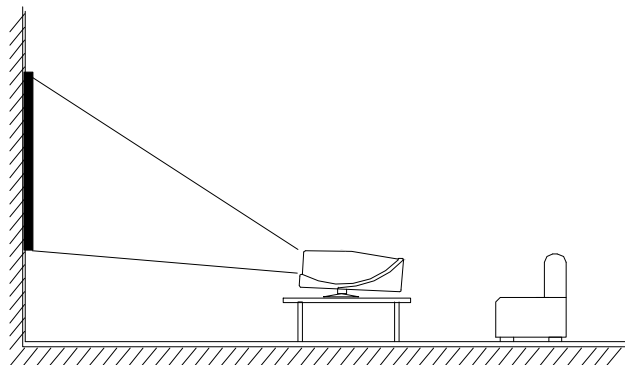
Switching on and settings

- Optically focusing the lenses (page 14)
- Magnetically centring the raster
- Electronic focusing (page 15)
- Fine adjusting the convergence
- Bank.. configuration.

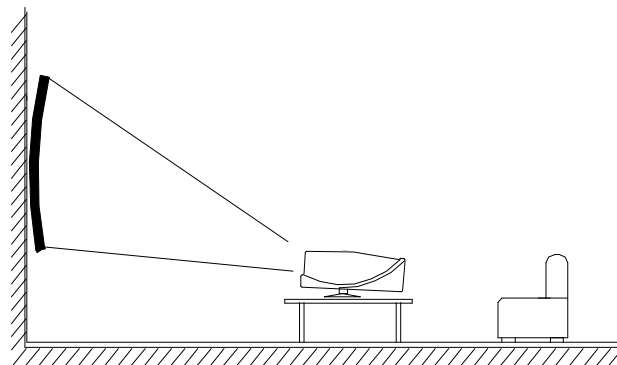


Closing the covers.

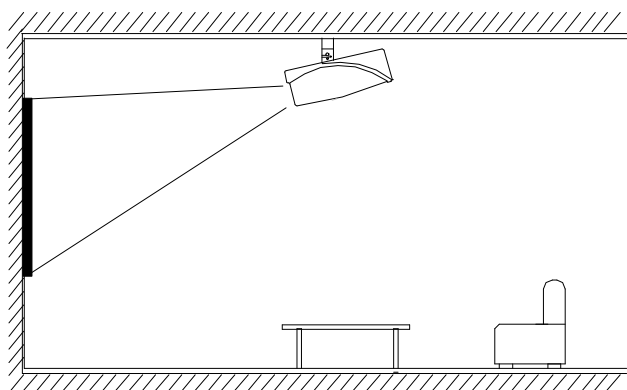
Installation options



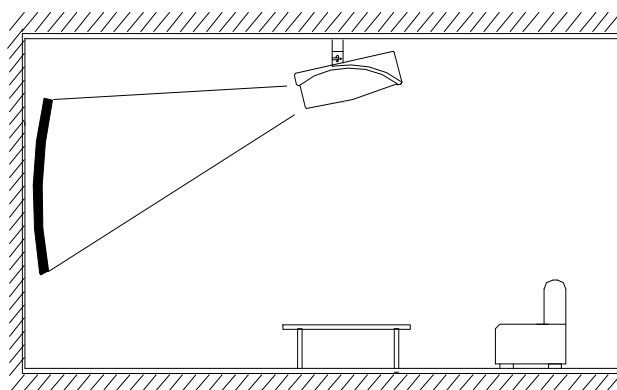
Front projection
Floor installation
Flat screen



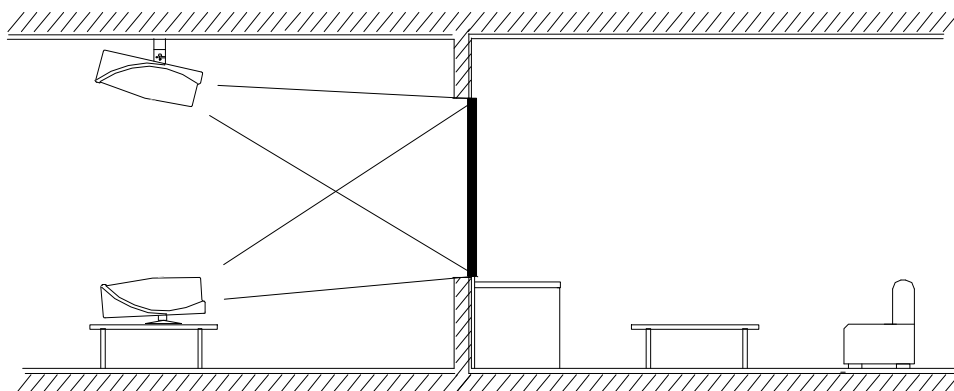
Front projection
Floor installation
Curved screen



Front projection
Ceiling installation
Flat screen

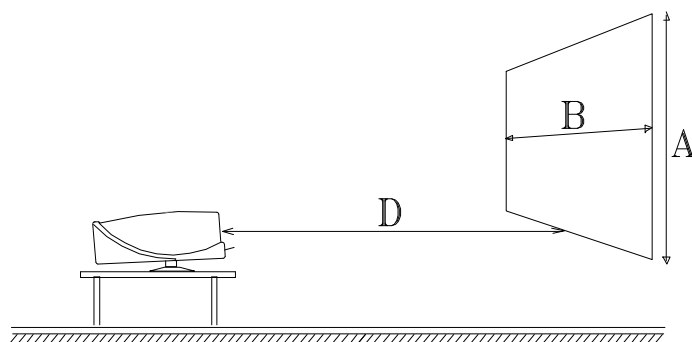


Front projection
Ceiling installation
Curved screen



rear projection floor or ceiling installation

Picture size and projector - screen distance



D = distance from the screen to the edge of the lenses

B = length of the base of the screen

A = high of the screen

The following table gives the measurements for each picture size.

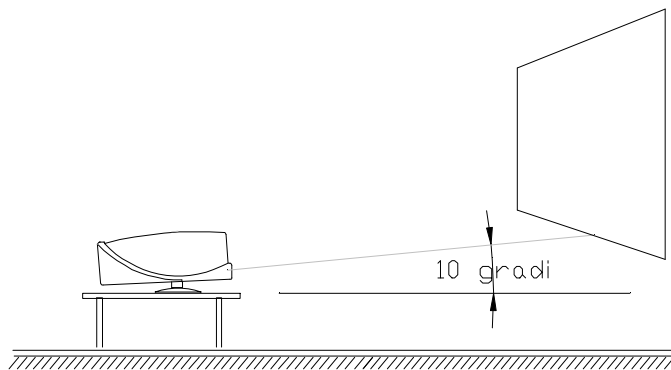
Screen size in inches	Base "B" in cm	High "A" in cm	Distance "D" in cm
70"	142.2	106.7	213,3
75"	152.4	114.3	228,6
80"	162.5	122	243,7
85"	172.7	129.5	259
90"	182.9	137.1	274,3
95"	193	144.8	289,5
100"	203.2	152.4	304,8
105"	213.3	160	319,9
110"	223.5	167.7	335,2
115"	233.7	175.3	350,5
120"	243.8	182.9	365,7
125"	254	190.5	381
130"	264.1	198.1	396,1
135"	274.3	205.8	411,4
140"	284.5	213.4	426,7
145"	294.6	220.9	441,9
150"	304.8	228.6	457,2

The table gives the parameters for some picture sizes. This is valid for crystal lens units. For screen sized other than these, use the following formula :

$$D = B \times 1.5 \quad A = B : 4 \times 3$$

If you are installing the projector on the ceiling remember to add to the "D" distance (25 cm) the distance from the bracket to the lens surface.

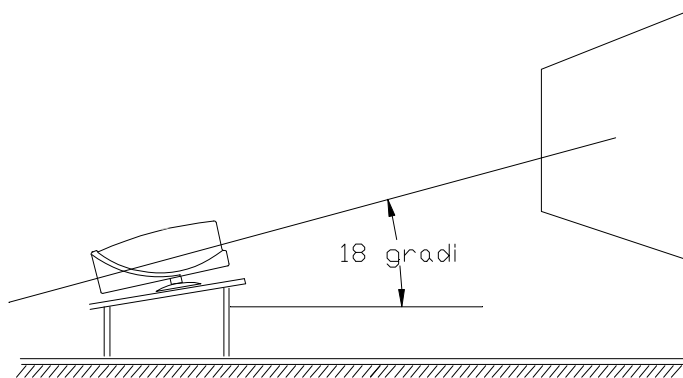
Projector angle



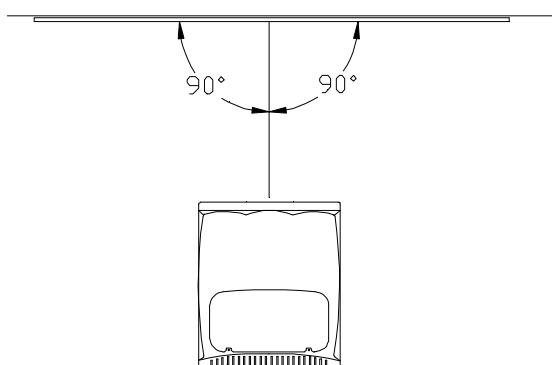
project with a vertical angle of 10 degrees

To have a best focalization all over the screen , changing the projection angle it is best to replace the correction spacer in accordance with the relative chart

Suggested projection angle 10 degrees



Maximum projection angle
(it advisable not to exceed 18 degrees)



The best result can be achieved when the projector is perpendicular to the screen.

The adjustment permit the correction of the misalignment of few degrees, thus as precise is the installation as less the electronic circuit would work

Optical focusing lens correction spacers

The position of the projector to the screen (projector angle) and the horizontal position of the lenses, -red, green and blue- which are in a line, will give a difference in the asymmetric focal length between the various sources of the picture and the corresponding projected picture on the screen. The two adjustment possibilities on the lenses (see optical focusing in the figure on page 14) only act symmetrically on the picture. Thus it is necessary to make some asymmetrical adjustments for each kind of installation in order to improve focus over the whole screen. Using the following table select which spacers to use in the given points (A B C D E) and then install them.

NB:

Unless the customer otherwise specifies in the order, the projector will be factory set for 100" screen projector at 10°.

If required with any other configuration you will have to change the spacers in accordance with the table below. You should bear in mind that an approximate screen size of +/- 15" and +/- 2° will not substantially affect the picture quality.

A number of calibrated spacers are supplied so that you can carry out the necessary installation.

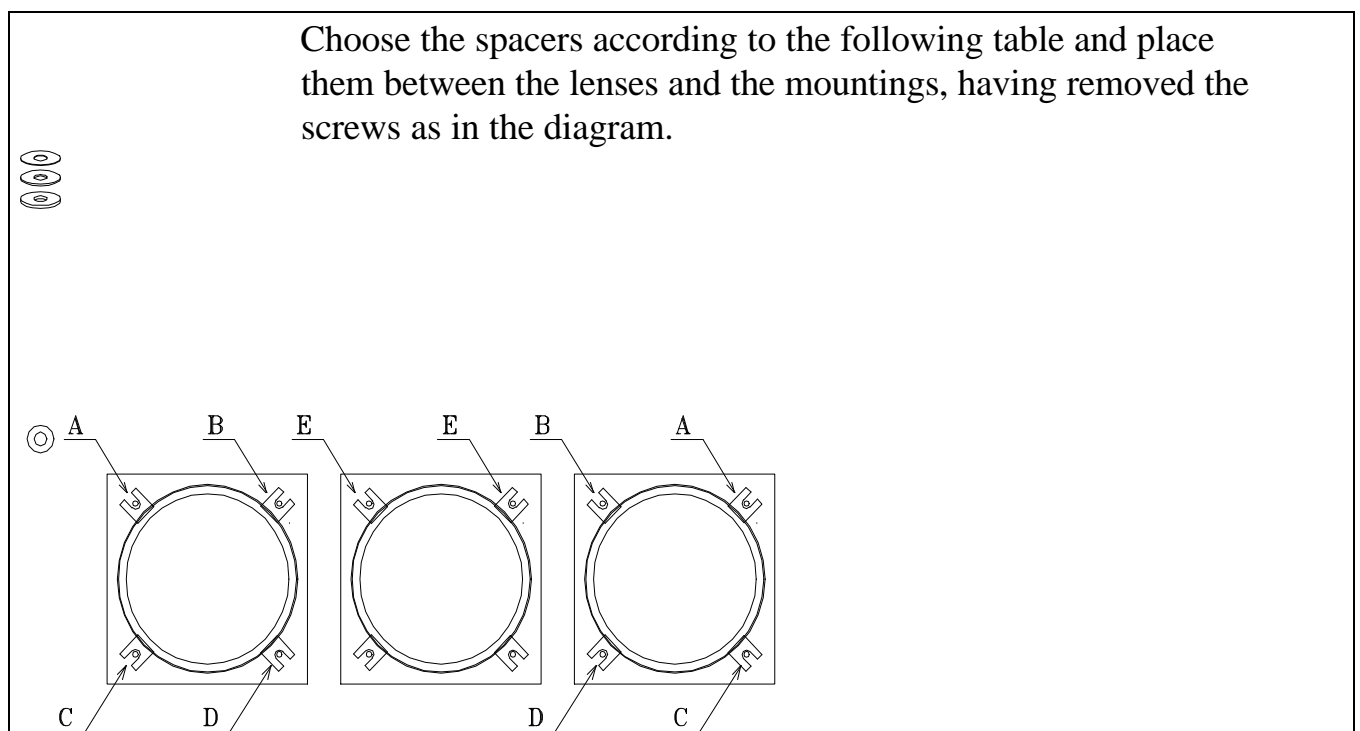


Table of asymmetrical lens correction spacers for optical focus

	Screen size 60"				Screen size 80"				Screen size 100"			
	Projection angle				Projection angle				Projection angle			
	0°	12°	15°	18°	0°	12°	15°	18°	0°	12°	15°	18°
A	-	1.7	2	2	-	1.3	1.5	2	-	1	1.3	1.5
B	1	2.5	2.5	2.5	0.7	2	2.3	2.6	0.5	1.5	1.8	2
C	1	-	-	-	0.7	-	-	-	0.5	-	-	-
D	-	1	1	1	-	0.7	0.7	0.7	-	0.5	0.5	0.5
E	-	2	2.2	2.2		1.5	2	2.2		1	1.3	1.5

	Screen size 120"				Screen size 150"				Screen size 180"			
	Projection angle				Projection angle				Projection angle			
	0°	12°	15°	18°	0°	12°	15°	18°	0°	12°	15°	18°
A	-	1	1.3	1.5	-	0.8	1	1.2	-	0.6	0.8	1
B	0.3	1.5	1.8	1.8	0.2	1	1.5	1.7	0.1	0.8	1	1.3
C	0.3	-	-	-	0.2	-	-	-	0.1	-	-	-
D	-	0.5	0.5	0.5	-	0.3	0.3	0.3	-	0.2	0.2	0.2
E	-	1	1.3	1.5		0.8	1	1.2		0.7	0.8	1

	Screen size 200"				Screen size 250"				Screen size 300"			
	Projection angle				Projection angle				Projection angle			
	0°	12°	15°	18°	0°	12°	15°	18°	0°	12°	15°	18°
A	-	0.6	0.8	1	-	0.6	0.8	0.8	-	0.6	0.6	0.6
B	0.1	0.8	1	1.3	0.1	0.8	1	1.7	0.1	0.8	0.8	0.8
C	0.1	-	-	-	0.1	-	-	-	0.1	-	-	-
D	-	0.2	0.2	0.2	-	0.2	0.2	0.2	-	0.2	0.2	0.2
E	-	0.7	0.8	1		0.7	0.8	0.8		0.7	0.7	0.7

Front projection - rear projection - ceiling - floor

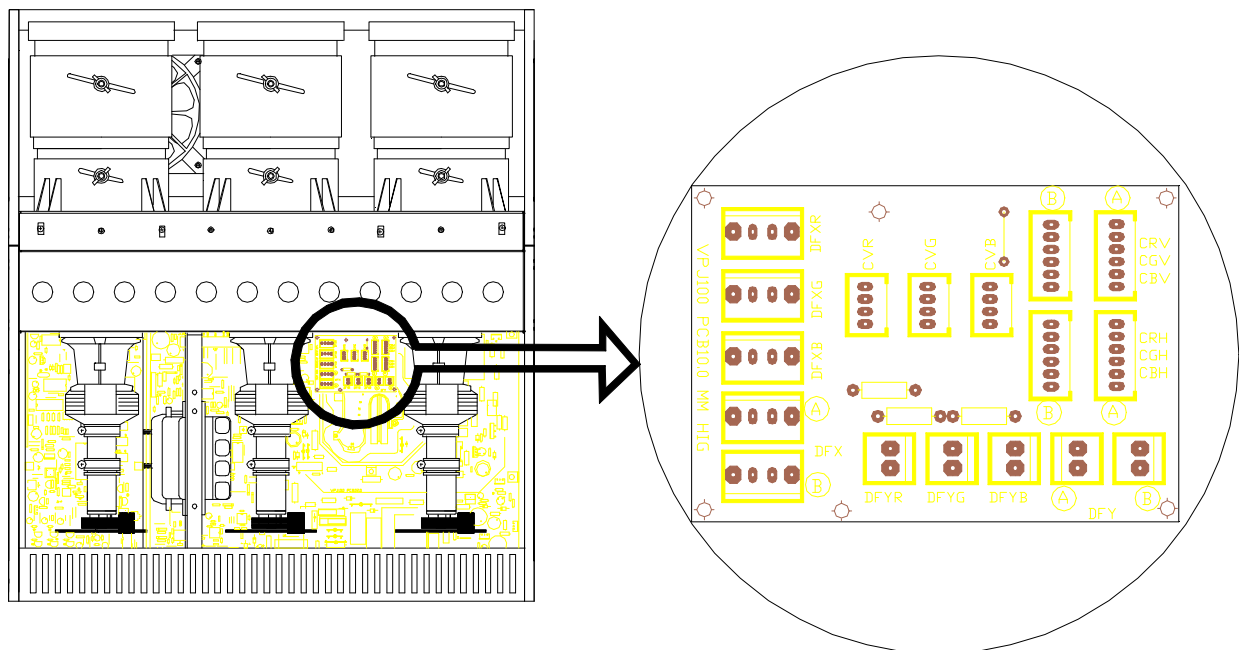
Unless otherwise specified by the customer, the projector will be supplied pre-aligned for front projection from the ceiling for a 100" screen (2m x 1.5m).

For the other three installation methods the deflection and the convergence configurations will have to be made accordingly.

The following diagram shows the module carrying the deflection and convergence connections. To obtain the required configuration invert the connections as shown in the table "Deflection inversion table".

When the deflection current has been inverted the projector will have to be completely reset. Switch off the projector before you invert the current and ensure that all connections are tight. Faulty operations may cause irreparable damage to the tubes.

!!! Switch off the projector before you invert the connections !!!



Deflection inversion table

	DEFLECTION		CONVERGENCE	
KIND FOR PROJECTION	horizontal DFX	vertical DFY	horizontal CRH CGH CBH	vertical CRV CGV CBV
FLOOR FRONT	A	A	A	A
CEILING FRONT	B	B	B	B
FLOOR REAR	B	A	B	A
CEILING REAR	A	B	A	B

NB:

Deflection inversion from the floor to the ceiling and vice versa requires adjustment of the horizontal keystone. this is done using button "A" (10) on the remote control (see instruction manual).

When you have inverted the deflection from the floor to the ceiling and vice versa you may have to realign the yokes. In any case you will have to carry out convergence again starting from the mechanical zero of the potentiometers. See diagram on page 21.

Explanatory note for the keystone function

1 Select the Bank you chose for the inversion.



2. Activate the main menu and select the "SIZE ADJ." option (

3. Place the cursor on "KEYSTONE"

The current adjustment value usually ranges between "35" and "45", roughly corresponding to a proper correction for projection corners ranging between 5° and 12° .

4. Press the button on the remote control marked with "TEST", and hold it pressed for about 5 seconds. This passage is meant to activate the "service" mode for the internal testing and it is important because there are no explicit signals that the switching actually took place. Perform this operation with care. Particularly, the passage to display the test grid must take place some seconds after you pressed the "TEST" button and during such interval the cursor must not be displayed near the current menu.

5. Press the "A" button from the remote control. You need to observe a clear inversion in the keystone. (NB: if the switching does not occur in a clear way, try to increase the keystone correction value up to "50" "60". Press the "A" button again. If you do not detect any change, repeat the operations starting from point 1, taking special care for point 4.)

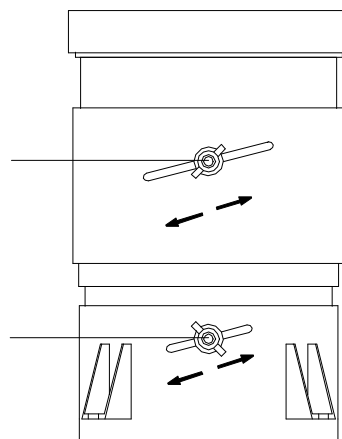
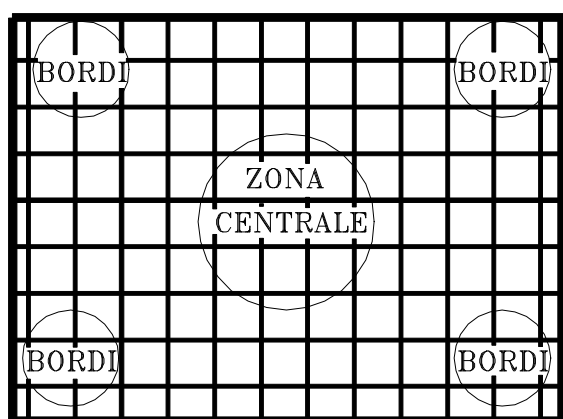
Now adjust, with the  and  cursors the right keystone value, which for a projection corner which respects the common values should not differ very much from the one previously adjusted.

6. After performing the inversion, exit the program by pressing again the "TEST" button and holding it pressed for about 5 seconds, with a procedure similar to the one performed to enter the "SERVICE" mode. After some seconds, the program will display the screen that was active before this procedure was started.

7. Save the new keystone parameter by pressing the "M" button (yellow) on the remote control and then the number of the Bank chosen for saving.

Optical focusing

Activate the signal "green field test", (or "white field test" and cut out the red and the blue using the supplied lens covers); adjust the brightness and contrast to a medium setting so that there is no phosphor saturation. Unscrew the wing nuts and rotate the two parts of the lens, first the part for centre adjustment then the part for the edge, until you get the best possible focus over the whole screen. Tighten the wing nuts. Repeat the operation for the other two lenses.



Correct optical focus over the whole screen also depends on the correction spacers being mounted (see page 10).

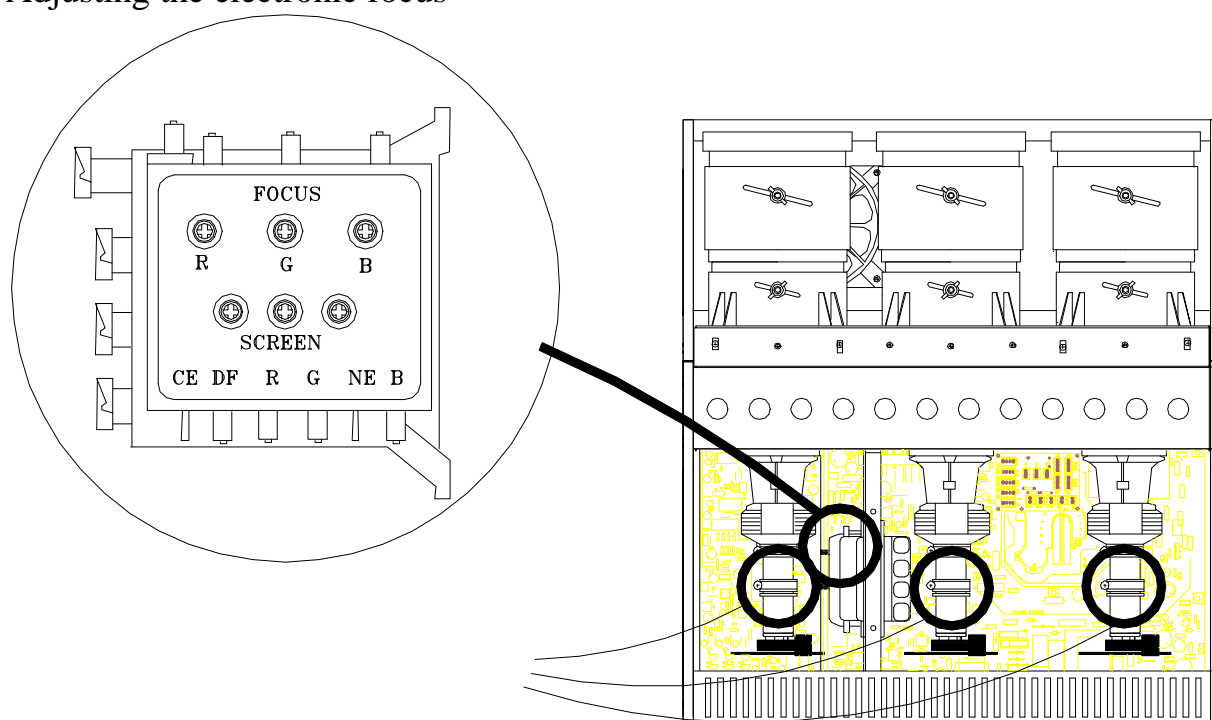
To obtain good picture focus it is also important to set the electronic focus and the focus rings. (see page 15).

Electronic focusing

These settings are usually pre-set and thus do not need adjusting to the kind of installation. However, you can check and fine adjust the best electronic focus position using "Focus R G B".

Find the best picture between centre focusing and edge focusing for each raster.

Adjusting the electronic focus

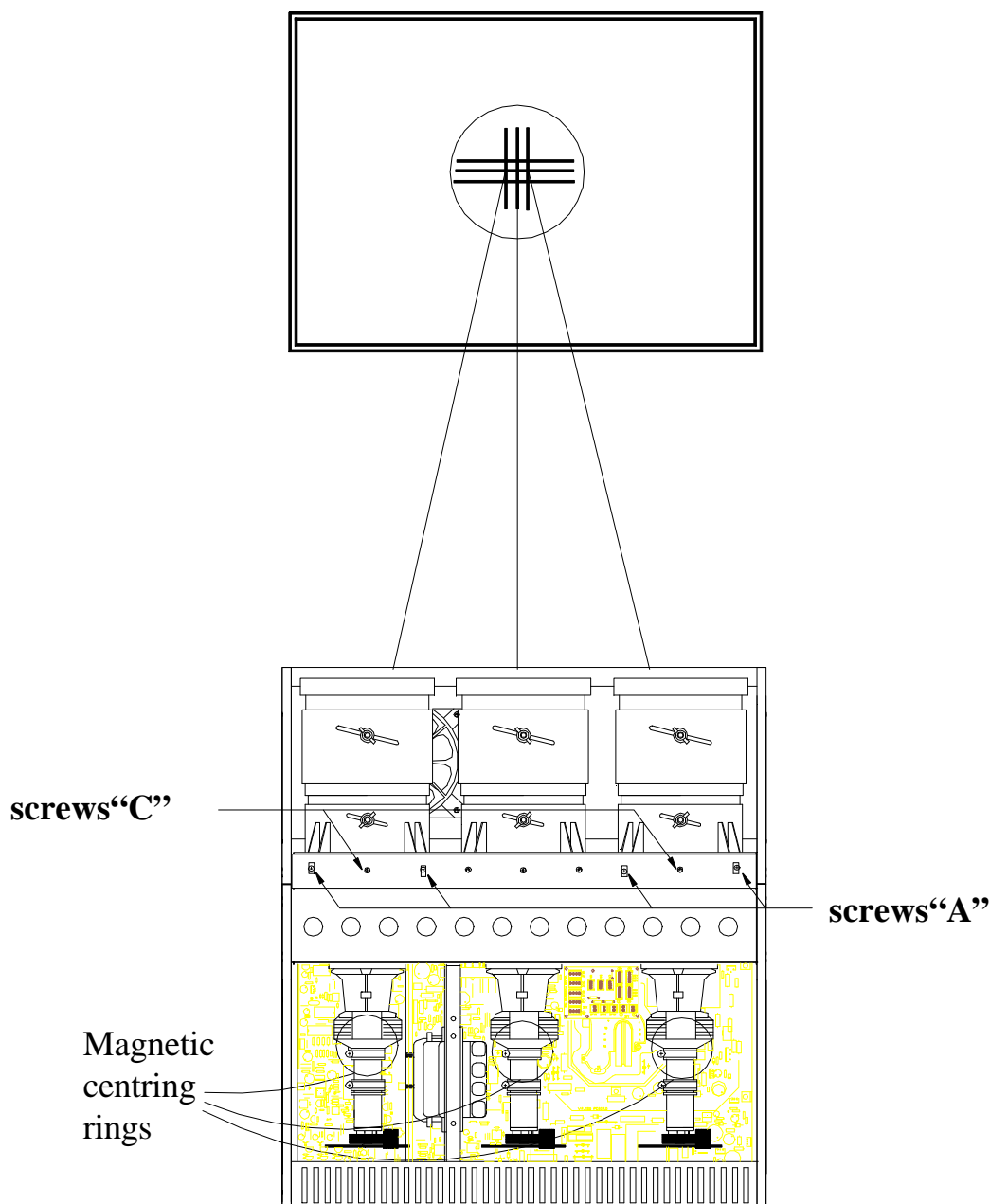


Magnetic focus
rings

-Magnetic focusing

The magnetic focus rings are pre-set for best performance and do not usually require further adjustment based on the kind of installation. If checked, and adjustment is as good as possible, you are advised to check the settings for each tube to find the best setting between the centre of the picture and the edges. Remember that the rings mainly affect the astigmatic effect of the spot.

Mechanical and magnetostatic picture centring



Before you mechanically centre the projector you must **reset** any vertical or horizontal electronic shift corrections using the remote control, as well as the magnetic corrections made to the magnetic centring rings.

*NB: The electronic shift adjustments using the remote control will be reset when the OSD displays 50 for that function (this is usually factory set in all the Banks).

The potentiometers on the convergence board, used for manual shift setting, must be in the mechanical centre (see diagram on page 21).

*NB: The magnetic centring rings behind the yokes must be rotated so that the two plates are overlapping, vertical and perpendicular to the rotating axis of the tube-lens unit.

When you have checked that the above is correct, mechanically converge the picture at the centre of the optical axes. Unscrew the locking screws "A" (see diagram), rotate the two tube-lens units, red and blue, around screws "C", which act as pins. Continue to rotate until two red and blue rasters horizontally overlap the green raster in the centre position. The result should give a symmetrical distance between the front surfaces of the lenses. If this is not achieved compensate for the difference using the magnetic centring rings.

Then rotate the magnetic centring rings on the red lens and then the blue lens until you achieve perfect overlapping, vertically as well, at the centre of the three rasters.

In normal projection conditions the green raster should not need moving. However, if there are slight positioning errors of the projector with the screen you can adjust the green adjusting rings.

Good mechanical and magnetic centring between the rasters will lead to less electronic convergence adjustment, thus less energy loss along the convergence circuits.

NB: When you have finished remember to tighten the screws.

Rotating the yokes

Inversion of the deflection current, as described on page 13, may require an adjustment of the perpendicular line of the deflection yokes (in particular the red yoke).

To carry out this correctly proceed as follows:

- The vertical and horizontal "skew" (see page 21) for electronic Convergence must be reset (potentiometer mechanical centre)
- The yokes must only be slightly rotated and not moved forward or backward on the tube neck. Thus, unscrew the locking screws just enough to rotate the yokes.
- Rotate the yokes to align the vertical and horizontal lines that run through the centre of the picture. Make sure you evenly spread any perpendicular error between the vertical and horizontal lines.
- All yoke rotation must be carried out with the framework closed in the normal working condition.

NB: When you have finished remember to tighten the screws.

Adjusting picture geometry

You can adjust picture geometry using the remote control. The adjustment can be saved in any available Bank.

The projector is supplied with standard Bank configuration for normal functioning.

However, some parameters in all the Banks will need adjusting to the new installation (see also Instruction Manual).

The main geometry adjustments are:

- main horizontal size
- main vertical size
- main horizontal keystone
- east-west pincushion
- horizontal phase

Inversion of the horizontal keystone (ceiling - floor)

(see button "A" function on remote control in the instruction manual).

Adjusting the convergence

Basic conditions for correct convergence:

- correct optical and electronic focusing
- mechanical centring of optical axes
- mechanical locking of all moving or unscrewed parts
(lenses, optical axes, framework, etc.,)
- magnetic picture centring
- picture geometry setting
- resetting the convergence potentiometer
- shift setting to "50" on the "OSD" using the remote control
- adjusting the corners to "40" on the "OSD" using the remote control

Check the above conditions. Leave the projector in for a few minutes until the correct working temperature is reached.

Adjusting the green

Begin by adjusting the distortion in the green field. Cover the red and the blue, with the aid of the diagram on page 22, and find the right potentiometer. Adjust the following one at a time:

- Vertical skew
- North - South
- Vertical keystone
- Horizontal line
- Vertical line
- Horizontal Bown
- Vertical Bown

*If required fine adjust the picture geometry using the remote control.

Overlapping green with red

Activate the red field and then firstly adjust the horizontal and vertical Skew for the horizontal and vertical centre line. Adjust the vertical and horizontal Bown until the centre red and green lines are parallel.

Now, using a combination of the following:

horizontal red linearity, horizontal red amplitude and the red magnetic centring rings (on the red yoke) overlap the vertical green lines with the red lines as well as possible. (do not use any other shift adjustment).

If necessary use the left and right openings.

Repeat the operations until you have overlapped all the vertical lines.

At this point adjust the red north-south and the red vertical keystone until the red horizontal lines are as parallel as possible to the green lines.

If necessary, adjust the red horizontal and vertical Skew again as well as the red horizontal and vertical Bown.

Now overlap the green horizontal lines with the red ones using the following: vertical red linearity, vertical amplitude and the red magnetic centring rings (on the red yoke).

(NB: when adjusting the centring rings for vertical shift you must also maintain horizontal overlapping).

If necessary use the top-bottom openings.

Fine adjust all the setting made so far to improve the results.

Ensure that the corner adjustments made using the remote control show "40" on the "OSD".

Now move on to the settings for vertical and horizontal angles.

Overlapping of red with blue

Switch off the green field and switch on the blue one. Repeat the operations done for the red field on the blue adjusting parameters by overlapping the red field with the blue field.

First of all set the horizontal and vertical Skew for the centre horizontal and vertical lines. Set the vertical and horizontal Bown until the blue and red centre lines are parallel.

Now, using a combination of the following:

horizontal blue linearity, horizontal blue amplitude and blue magnetic centring rings (on the blue yoke), overlap the vertical red lines with the blue lines as well as possible. (Do not use any other shift adjustments).

If necessary use the left and right openings.

Repeat the operations until you have overlapped all the vertical lines.

At this point adjust the blue north-south and the blue vertical keystone until the blue horizontal lines are as parallel as possible to the red lines.

If necessary, adjust the horizontal and vertical Skew and horizontal and vertical Bown of blue.

Now overlap the red horizontal lines with the blue ones using the following: vertical blue linearity, vertical blue amplitude and the blue magnetic centring rings (on the blue yoke).

(NB: when adjusting the centring rings for vertical shift you must also maintain horizontal overlapping).

If necessary use the top-bottom openings.

Fine adjust all the blue setting made so far to improve the results.

Ensure that the corner adjustments made using the remote control show "40" on the "OSD".

Now move on to the setting for the vertical and horizontal angles.

Switch on the green field again and if necessary fine adjust any settings.

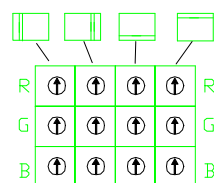
Any geometry and convergence changes made using the remote control must be saved in the Banks.

If the internal test generator is on when you save the settings then the test generator will be saved as an input. Thus you are advised to switch off the test generator before you save the setting in the Banks.

Resetting the convergence settings

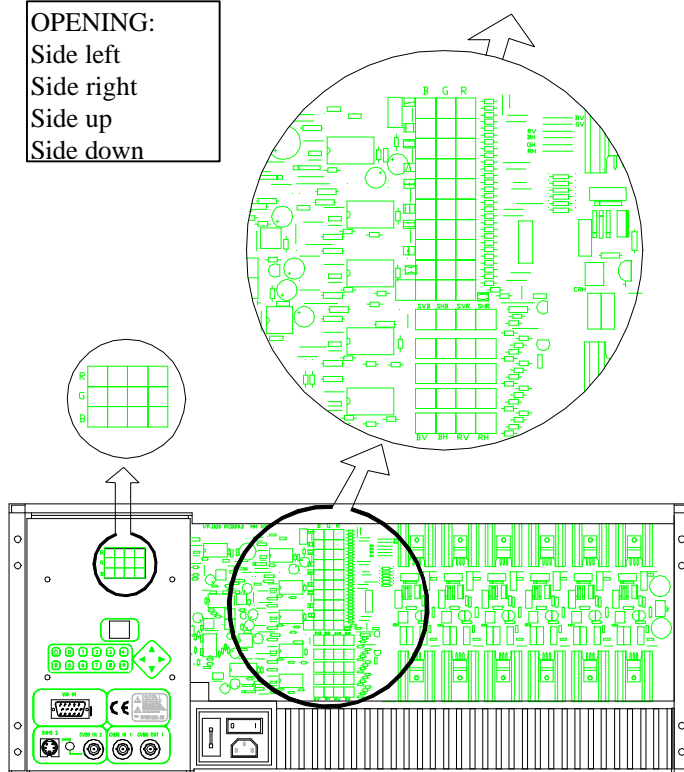
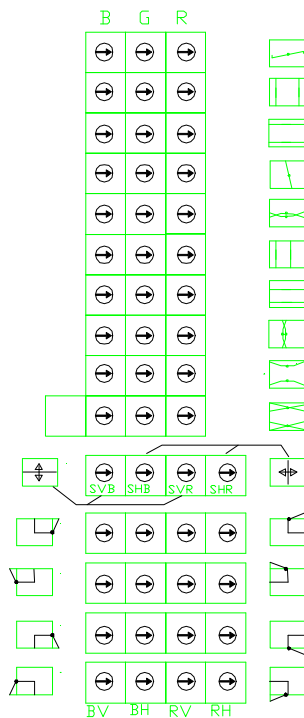
IMPORTANT

The potentiometer's arrows indicate the position neutral. To obtain a correct convergence you are advised to pre-positioning the potentiometers as for the drawing



OPENING:

Side left
Side right
Side up
Side down



Vertical skew
Horizontal amplitude
Vertical amplitude
Horizontal skew
Vertical bown
horizontal linearity
vertical linearity
horizontal bown
north- south
horizontal keystone
horizontal and vertical shift R B
top right corner R B
top left corner R B
bottom right corner R B
bottom left corner R B

NB: Do not carry out any potentiometer setting other than those given on this page

Next to the possible setting on the board there are some factory pre set ones. If these are tampered with, a trained technician will have to re-set them using such instruments such as an oscilloscope and a VGA video generator!

Convergence MAP

NOTE:

- To best regulate the shift is better to adjust before the magnetic centring rings located on the deflection yokes.
- The shift regulations via IRC are at 0 when the OSD indicates 50
- The corner regulations would be the last to be executed.
- The corner adjustment can be handle via IRC: see menu "CONVERGENCE" This regulation has been design mainly to compensate the vertical amplitude difference if any, going from 4:3 to 16:9 format. Before to work with the corner adjustment, be sure to have the corresponding value on the OSD indicating 40

